

CLAIMS

1. A particle binding composition comprising the mixture products of:

water;

a carbohydrate;

a protein;

an iron compound;

a strong base; and

a pH adjustor included in an amount so that the composition has a pH in

a range of about 10 to about 13.
2. A particle binding composition as defined in claim 1, said water having a
concentration in a range of about 60% to about 99.9% by weight of the particle binding
composition.
3. A particle binding composition as defined in claim 1, wherein said
carbohydrate and said protein comprise at least one type of endosperm.
4. A particle binding composition as defined in claim 3, wherein said
endosperm is derived or extracted from at least one type of cereal grain or legume.
5. A particle binding composition as defined in claim 4, wherein said
endosperm is derived or extracted from at least one member selected from the group
comprising wheat, rice, potatoes, corn, barley, sorghum, soy beans, pinto beans.

6. A particle binding composition as defined in claim 1, wherein said carbohydrate and protein of said endosperm are derived from a single source.

7. A particle binding composition as defined in claim 1, wherein said carbohydrate and protein of said endosperm are derived from different sources.

8. A particle binding composition as defined in claim 1, said endosperm having a concentration in a range of about 25% to about 95% by weight of solid components exclusive of said water.

9. A particle binding composition as defined in claim 1, said endosperm having a concentration in a range of about 50% to about 85% by weight of solid components exclusive of said water.

10. A particle binding composition as defined in claim 1, said endosperm having a concentration in a range of about 60% to about 75% by weight of solid components exclusive of said water.

11. A particle binding composition as defined in claim 1, said iron compound comprising at least one type of iron oxide.

12. A particle binding composition as defined in claim 1, said iron compound comprising at least one of ferric oxide, ferrous oxide, iron halide or iron hydroxide.

13. A particle binding composition as defined in claim 1, said iron compound having a concentration in a range of about 0.01% to about 5% by weight of solid components exclusive of said water.

14. A particle binding composition as defined in claim 1, said iron compound having a concentration in a range of about 0.1% to about 1% by weight of solid components exclusive of said water.

15. A particle binding composition as defined in claim 1, said strong base comprising at least one member selected from the group comprising alkali metal oxides, alkaline earth metal oxides, alkali metal oxides, alkali metal hydroxides, and alkali metal carbonates.

16. A particle binding composition as defined in claim 1, said strong base having a concentration in a range of about 15% to about 50% by weight of solid components exclusive of said water.

17. A particle binding composition as defined in claim 1, said strong base having a concentration in a range of about 25% to about 40% by weight of solid components exclusive of said water.

18. A particle binding composition as defined in claim 1, said pH adjustor comprising at least one organic or inorganic acid.

19. A particle binding composition as defined in claim 1, wherein said pH adjustor is included in an amount so that the composition has a pH in a range of about 10.5 to about 12.8.

20. A particle binding composition as defined in claim 1, wherein said pH adjustor is included in an amount so that the composition has a pH in a range of about 11 to about 12.6.

21. A particle binding composition as defined in claim 1, further comprising a fibrous material and seeds.

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22. A precursor composition for use in manufacturing a particle binding composition, comprising:

a carbohydrate;

a protein;

an iron compound;

a strong base; and

a pH adjustor included in an amount so as to form a particle binding composition having a pH in a range of about 10 to about 13 after the precursor composition is mixed with water.

23. A precursor composition as defined in claim 22, the precursor composition comprising at least two parts that are initially stored separately so that said two parts are individually mixable with water when manufacturing the particle binding composition.

24. A precursor composition as defined in claim 22, wherein said carbohydrate and said protein comprise at least one type of endosperm.

25. A precursor composition as defined in claim 24, a mixture of at least a portion of said endosperm, iron compound and strong base comprising a first part of the precursor composition and the pH adjustor comprising a second part of the precursor composition.

26. A method of manufacturing a particle binding composition, comprising:
mixing together water, an endosperm comprising carbohydrate and protein, an iron compound, and a strong base to form an intermediate composition having a pH above 13; and
adding a pH adjustor to the intermediate composition to form the particle binding composition, the particle binding composition having a pH in a range of about 10 to about 13.

27. A method as defined in claim 26, further comprising adding a fibrous material and seeds to the intermediate composition or particle binding composition.

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28. A method of treating soil in order to bind particles found therein, comprising:

applying the particle binding composition of claim 1 to soil; and

allowing the particle binding composition to bind particles found within the soil.

29. A method of treating soil as defined in claim 28, the particle binding composition being applied by aerial spraying or broadcasting.

30. A method of treating soil as defined in claim 28, the particle binding composition being applied by mechanical ground-based spraying or broadcasting.

31. A method of treating soil as defined in claim 28, the particle binding composition being applied by manual spraying or broadcasting.

32. A method of treating soil as defined in claim 28, the particle binding composition being applied to soil at a construction site in order to prevent erosion.

33. A method of treating soil as defined in claim 28, the particle binding composition being applied to soil at a burn site in order to prevent erosion.